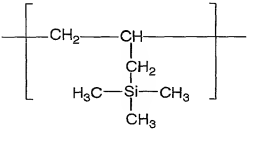
WHAT IS CLAIMED IS:

1. A novel copolymer comprising:

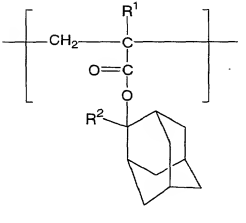
a repeating unit (B) derived from an unsaturated carboxylic anhydride;

a repeating unit (C) represented by Formula (II); and

a repeating unit (D) represented by Formula (III):



(II)

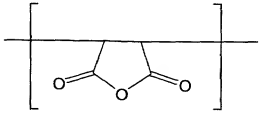


(III)

wherein R^1 is a hydrogen atom or a methyl group; and R^2 is an alkyl group having from 1 to 4 carbon atoms.

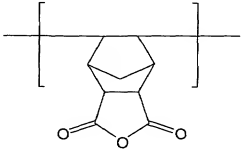
2. A novel copolymer according to claim 1, wherein said repeating unit (B) is a repeating unit (B-1) derived from a unsaturated cyclic carboxylic anhydride.

3. A novel copolymer according to claim 2, wherein said repeating unit (B-1) is a unit (B-2) represented by Formula (V):



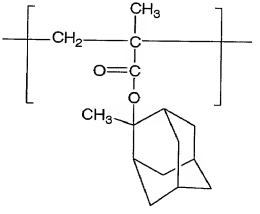
(V)

4. A novel copolymer according to claim 2, wherein said repeating unit (B-1) is a unit (B-3) represented by Formula (XVI):



(XVI)

5. A novel copolymer according to claim 1, wherein said repeating unit (D) is a unit (D-1) represented by Formula (VI):



(VI)

6. A novel copolymer according to claim 1, wherein the content of repeating unit (B) is equal to or more than 15% and equal to or less than 60% of all repeating units constituting said novel copolymer.

7. A novel copolymer according to claim 1, wherein the content of repeating unit (C) is equal to or more than 10% and equal to or less than 40% of all repeating units constituting said novel copolymer.

8. A novel copolymer according to claim 1, wherein the content of repeating unit (D) is more than 0% and equal to or less than 40% of all repeating units constituting said novel copolymer.

9. A novel copolymer according to any one of claims 1 to 8, wherein said novel copolymer has a weight average molecular weight (Mw) in terms of polystyrene of from 7000 to 30000 and a molecular-weight distribution (Mw/Mn, where Mn is a number average molecular weight) of equal to or less than 3.5.

10. A photoresist composition comprising:
a novel copolymer according to claim 1;
a photosensitive acid generator; and
an organic solvent.

11. A photoresist composition according to claim 10, wherein said photosensitive acid generator is a triphenylsulfonium-based onium salt.

12. A photoresist composition according to claim 10, wherein said organic solvent is propylene glycol monomethyl ether acetate (PGMEA).

13. A process for forming a resist pattern with a high aspect ratio, said process comprising the steps of:

(a) applying a first resist on a substrate and drying the applied first resist to thereby form a first resist layer, applying a photoresist composition of claim 10 onto the first resist layer and drying the applied photoresist composition to thereby form a second resist layer;

(b) exposing the second resist layer to imaging radiation, subjecting the exposed second resist layer to a heat treatment, and dissolving and removing exposed portions or unexposed portions of the second resist layer by developing in an alkaline aqueous solution to thereby form a resist pattern;

(c) applying a silylation agent onto the formed resist pattern, rinsing the applied resist pattern to thereby enlarge the resist pattern and to form a silylation coating on the resist pattern, said silylation coating being resistant to corrosion induced by oxygen-containing plasma etching; and

(d) etching the first resist layer under the second resist layer with oxygen-containing plasma by using, as a mask, the enlarged resist pattern carrying the silylation coating.